

Fun with Plants!

Shelley Mitchell, PhD
Associate Extension Specialist
OSU Dept. of Horticulture & Landscape Architecture
Stillwater, OK
shelley.mitchell@okstate.edu
405-744-5755

Listed are activities that I have used successfully with kids around the state of Oklahoma. Feel free to contact me for additional information about these activities. I also keep a Facebook page for the "Oklahoma School Garden Network", where I post great ideas and examples I run across.

** - denotes kid favorites

Starting the Day:

Decorate tree cookie nametags (slices of tree branches cut and 'hole punched' with a drill press to allow it to be hung on a necklace of yarn or cord) with markers, use yarn to make a necklace for the nametag

Make **headband antennae nametags from 1.5" or 2" strips of posterboard (stapled to fit around campers' foreheads) and pipe cleaners (attached with packing tape to the backside of the front of the headband, directly over their printed name). Campers can make any kind of antennae they want out of pipe cleaners (feathery, curly, ones with knobs on the ends---be creative!).

Short, minimum preparation activities (5-30 min)

The "Mostest" Scavenger Hunt

Some items on the list are: Tiniest flower Smoothest stone Fattest leaf Biggest seed Most colorful plant Prettiest feather Weirdest bug Reddest rock Juiciest-looking berry Tallest blade of grass Most unusual plant Most twisted stick Biggest piece of trash

Leaf (\$9.79) and flower (\$8.95) rubbing plates from Nature Watch (use crayons and copy paper; tape plates down along edges of table to hold them still and space them and the campers out); Nature Watch website: <http://www.nature-watch.com/>

Junior Plant Scientist investigations at <http://jrplantscientist.ath.cx> – free, printable PDF investigations for kids to do in the garden, at home, and online; 10 investigations include: Plant Discovery, Plant Names, Plant Uses, Plant Life Cycles, Plant Morphology, Plant Physiology, Plant & Animal Interactions, Rare & Endangered Plants, Taking Care of Plants, and Celebrate Plants

P.L.A.N.T.S. needs (JMG activity about what plants need to grow)—campers brainstorm to determine that PLANTS stands for place, light, air, nutrients, thirsty (water), and space – all things that plants need in order to grow

****Gas Gobblers** (JMG activity to demonstrate the interrelatedness of animals and plants) – requires each child to have bubble solution, takes about 10 minutes

Color your own flower pots from Oriental Trading (about \$1.50 each, also available at Walmart or craft stores)-- clear plastic pots with scenes to color and insert.

****Mud pies** –put wet soil on paper plates, put flat rock in middle, spread some syrup on the rock and salt on the mud, and lay them out in the shade somewhere in the garden; check every day to see what insect visitors you get -- mud pie idea from Sharon Lovejoy's book *Toad Cottages and Shooting Stars*

Roly poly houses – each camper gets a baking potato and cuts it in half lengthwise, then hollows out each half and puts it back together using tape. A small opening in one end allows roly polies to use it as a 'house' for food and water (just put it in your yard in a safe place).

Measure tree heights using: 1) shadow method (measure a person and their shadow, the shadow of the tree, and solve for the height of the tree) and 2) 'pencil method' (hold a pencil at arm's length, use your thumb to mark the bottom of the tree and the tip of the pencil to mark the top of the tree, then rotate the pencil, keeping your thumb on the bottom of the tree, and have a helper walk to the end of your pencil tip, then measure the distance between the tree and your helper to get the height of the tree)

****Venus fly trap hand puppets** from paper plates (from JMG's "Literature in the Garden" curriculum); talk about why the trap is green on the outside (chlorophyll for photosynthesis), red on the inside (to attract insects), and how the trigger hairs work, then have the kids put their heads down and their puppets up. Walk around with a chopstick to 'trigger' the puppets, and leave raisins for 'insects'

Make 'books' to collect plant specimens in for paper making, pressing, etc.---take 3 lunch sacks and cut bottom ¼" of bag off (while it is still flat), fold all 3 bags as one, from top to bottom, and staple like a book at the fold (making a book with 'pages' that are either the top or bottom half of a lunch sack, and can hold small samples of plants, sticks, etc.)---this a) gets kids to tote their own collected items around (not the adults doing it), and b) cuts down on the amount of plant material kids gather (they tend to collect way too much)---some kids punch holes in the side of the sacks and make a 'necklace' to carry their treasures

Make pocket museums for collecting 'treasures' – Have the kids line tins (like Altoids containers) with felt (glue it in), and then they can fill the tin with little treasures and show others their little pocket museum!

****Clean Air Neck Pets** (punch hole in small plastic Ziploc bag made for jewelry, put a couple of beans and a wet cotton ball inside, make a necklace with it using yarn)---kids wear these and watch for germination. If kids think light helps germination, they wear the bag outside their shirt; if kids think warm temperature helps germination, they wear the bag inside their shirt. Who can get theirs to sprout first? This allows them to see the roots during germination as well as the shoots.

Talk "Dirty" -- Talk about what soil is made of (organic material, inorganic material, water and air spaces) and how long it takes to make soil (thousands of years per inch); **discuss the differences**

between clay, silt and sand particles and demonstrate their relative sizes using a basketball for sand, a baseball for silt, and a bb for clay; let the kids **feel the differences** between clay (wet cat litter also works), sand, and silt (dry flour feels like silt); **demonstrate the movement of water through different soil particles** by having half of the kids stand in a line (like the game Red Rover) and let the others walk between them (don't try to prevent movement, just let the kids see how easy it is to move between particles)---sand is represented by kids standing far enough apart that their hands just reach their neighbor's shoulders, silt is represented by kids standing far enough apart that their elbows just reach their neighbor's shoulders, clay is represented by kids standing side-by-side with sides touching

Talk "Dirty" part 2 - let kids **pour water** through flower pots full of either gravel, clay, sand, or potting soil to see how fast the water drains through (can make it a race to see whose water drains out fastest) and talk about how sandy soils don't retain water as much as clay soils, so you have to take that into account when watering plants in different environments; give each kid a plastic cup or flower pot with holes in the bottom, put a coffee filter in the bottom of the cup/pot to keep the soil inside, fill the cup/pot with soil, and let kids pour muddy water through---why does it come out clean? Discuss the **filtering properties of soil**. . .

Pasta metamorphosis –use paper plates, glue, markers and pasta to make a picture of the life cycle of butterflies (complete metamorphosis); divide the plate into fourths with a marker. The first stage (egg) is represented with acini di pepe pasta (draw a leaf around some to show where eggs are laid), the next stage (larva) is represented with rotini or fusilli 'spring' shapes (again, on a leaf which caterpillars eat), the pupal stage is represented by gnocchi or conchiglie shell shapes (hanging from a stick), and the adult is represented with butterfly-shaped farfalle (draw antennae and a flower). Arrows can be drawn between the quarters of the plate to show the direction of development.

****Termite NASCAR** – termites communicate using pheromones that just happen to be perfectly mimicked by Papermate ballpoint pens (only this brand). Used Papermate pens to draw trails for the termites to follow. Termites placed on paper follow fresh ballpoint pen trails around curves, along squiggly paths, etc. Termites can be found outdoors on rotting wood, or from university entomology departments. Sometimes exterminators have a colony to show people what they look like (or they could save some for you!). Use a paintbrush to handle the termites. They are very fragile.

****Maggot art** – Give each camper a piece of construction paper and allow them to put some 'blobs' of tempera paint in several places (this is really easy when the paint is in clear condiment dispensers). Then campers can place maggots (raised in clean labs and ordered for this purpose from fisherman supply companies or bait shops) in the paint. Maggots will wriggle away, leaving trails of paint and creating art. When the maggots are done, kids can put them in other colors of paint or put them back in bowls for use with other groups. The maggots can live a few weeks—slow their development by putting them in the refrigerator. Even squeamish campers found this to be fun! Order some maggots from http://knutsonlivebait.com/extrabright_maggots.html (\$8 plus s/h for 500 maggots) or try your local bait store---fisherman use these, especially for ice fishing---maggots come in a rainbow of colors! Also <http://www.vadosbait.com/index.php/bait-store/maggots/maggots-1000-411.html> (\$9 plus s/h for 1000 maggots)

Chew on This! – Junior Master Gardener activity allowing campers to experience eating like various insects do (use a damp sponge to pick up sugar like flies do, use stick pretzels at the corners of their mouth to pick up chocolate chips like a grasshopper would eat, drink out of a juice box through a straw like a mosquito or butterfly, etc.)

Make **sun safety bracelets** out of cord and pony beads (from Walmart), with a few UV-detecting color-changing pony beads per child. Talk about safety in the sun, and watch the UV beads change color as you walk outside. Will putting sunscreen on the beads keep them from changing color? (UV beads from Educational Innovations; 250 for \$6.95) Educational Innovations website:

<http://www.teachersource.com/>

****“Sound Off” game** – Some animals find mates using sound (but predators also listen!). To simulate this, have all children get into a circle on a flat surface (meadow, gymnasium) and then put on blindfolds. Give every child a noisemaker (bells, beans in a film canister, clickers, etc.), making sure that every noisemaker type has at least 2 to 4 people using it. They need to try and listen for someone making the same sound they are, and make their way over to them while blindfolded. For the first few rounds, just let them find someone making the same sound. When they find a correct ‘mate’, both players take off their blindfolds and walk quietly to the sidelines and sit as a pair until the simulation is over. After the campers understand their mission, introduce a predator for later rounds. The cost of making noise is that other animals are listening too, and for different reasons! Have the children try to find their mates blindfolded while trying not to attract the attention of the predator. If the predator finds them or runs into them (predator is also blindfolded but makes NO NOISE), the ‘prey’ is killed and takes off their blindfold and sits out for the rest of the round. If someone lives until the end of the game (stop when there are only ‘singles’ left making noises), but doesn’t find a mate, the species is in trouble even though one lived! Talk about how it felt trying to find your ‘mate’ by sound, knowing predators are also listening. You can talk about other examples of finding mates using *light* (lightning bugs, who flash in different patterns according to species, but there is an imposter who mimics the flashes and then eats the unsuspecting bugs who come over!), *smell* (salmon find their way back to their home spawning grounds using smell, and you can simulate this by making ‘trails’ of index cards sprayed with different scents to see if the students can follow a specific trail, or kids can try to find a ‘mate’ who has the same smell they do (film canisters with cotton balls soaked in different scents)), or *sight* (males of sexually dimorphic species are brightly colored or have long tail feathers, etc. to attract the females, but also so the predators are more likely to catch the males rather than the females on their nests).

****Plant pounding** –put a leaf on the sidewalk and place a piece of cotton cloth (white handkerchiefs work, or pieces of muslin) over it, then use a rubber mallet to pound the leaf so that the chlorophyll transfers to the cloth---keep the leaf and cloth from moving to get the best transfer; can also try pounding berries (carefully!!!) from some trees

Propagate plants vegetatively. We use snake plant, ficus, African violets, airplane plants, and Swedish ivy (the campers pick one they like). Campers fill their pots (we use our color-your-own flowerpots for this) with potting mix and then are shown how to make a cutting to propagate in their pots and take home.

Grow Your Name – glue grass seed in shape of your name onto paper towel, place on plate, cover with soil, mist with water

****Make Adobe Bricks** – mix 70% sand, 30% clay, some water, and some straw (optional); roll flat and cut bricks then leave to dry on wax paper or straw, or form bricks using ice cube trays (lay out to dry after they firm up in the brick shape) – leave to dry outside all week! When dry, build a little hut!

****Fundanas** – Bandanas with nature quests on them. . . the campers go off in small groups to complete quests depending upon the topic, then come back and share as a group. Tree Quest, Bug Bingo, Biodiversity Bingo, Scat & Track Quest, Lily's Pond Bingo, Nature Quest. . . website:
www.fundanabandanas.com

Plant Parts We Eat/Vegetable Rumba (Junior Master Gardener Basic Curriculum p. 9-10; also "Vegetable Rumba" in 4H curriculum *Food, Culture, and Reading* (BU-08379) p. 40-41); have students draw a generic plant with roots, stem, flower, leaves, seed, fruit; for each part of the plant, list some foods that we eat that come from that plant part; extension of activity—talk about how each part of the plant helps the plant grow or reproduce

Origins of Our Foods – every student gets a world map with the countries outlined (off of a Google image search for 'world map'---many to choose from); list of the continents/food origins available on p. 185-191 in *Cultural Uses of Plants: A Guide to Learning about Ethnobotany* by Gabriell DeBear Paye (18.50, ISBN 0-89327-422-4) and also p. 96 in *Food, Culture, and Reading* (4H Curriculum BU-08379); describe the uses of each plant for culinary, medicinal, cultural purposes and identify the continent of origin---students locate the continent and list the foods originating from it next to each continent (color each continent differently); optional, from p. 101 in *Food, Culture, and Reading* is a list of the five top fruit-producing countries for 8 specific fruits---identify and label those countries as well

Chewed Paper and Sticky Stuff – lesson from Oklahoma Ag in the Classroom at <http://www.clover.okstate.edu/fourh/aitc/lessons/intermed/pinata.pdf>; make maracas by putting a few beans in a water balloon and inflating the water balloon, then covering it with papier-mâché and letting it dry for a few days, then paint!

Discover the identities of the different beans in 15-bean soup mix. Use the chart here: <http://www.clover.okstate.edu/fourh/aitc/lessons/legumes.pdf> (on page 10). Glue the beans to cardboard to make mosaics.

Dirty pictures – gather soil from several different locations, or get sand, potting mix, and soil; use glue to draw on paper and sprinkle 'dirt' to color the glue and draw (like sand art, but with soils)

Mason bee houses -- using water bottles with the top cut off (all parts narrower than the main body) or tin cans, fill them to capacity with paper straws ordered from Aardvark in order to make houses for solitary Mason bees. As an alternative, you can tape around the outside of the straws. Hang your straws so that the open ends face east and are protected from the elements (under an overhang of some kind). Aardvark paper straws: <http://www.aardvarkstraws.com/> (Giant, 10.5" (Unwrapped) straws for extra tall shakes and smoothies, 10.5" long with a diameter of .292". Box: \$27.00 (350 qty.)).

Make a bird feeder—take an orange, cut it in half, and scoop out the orange. Now take the rind and thread strong fishing line or plastic lanyard through small holes to make it hang. Fill with peanut butter and birdseed and hang it in a tree or next to your window.

Build a Mayan pyramid out of small sponges (cut them into smaller pieces if necessary). Sprinkle with bird seed and grow your own chia pet (or use chia seeds from a health food store for a real chia pet!).

Use a microscope - Look at pollen, cotton fibers, dust, newspaper (it's a lot rougher than you think!), butterfly wings, fly wings, etc. Use a **stereomicroscope** to look at bulkier objects – the outsides of leaves, petals, twigs, etc.

Make rain gauges from clear plastic bottles—cut the tops off and use a ruler and a Sharpie to mark inch (or smaller) increments, starting from the bottom of the bottle. You can tape a stick or dowel rod to the outside to keep the rain gauge from falling over and anchor it into the ground.

Flower Presses - Make flower presses using cardboard and newspaper. If your specimens are very fresh, you may need to change the newspaper out each day at first. Keep things flat with a heavy book, rocks, or twine tied around the cardboard 'covers'.

The Power of Soybeans - Add glycerine (from soybeans—glycerine is with the first aid supplies at supermarkets) to bubble solution. Notice how much longer the bubbles last!

Nature's Designs - Use paper and crayons to collect different outside textures—take rubbings of bark, leaves, ironworks, planters, pots, pavers, etc.

Flower Arrangements - Use miniature clay pots and floral foam to make miniature flower arrangements using bought or collected flowers.

Seed Etch-A-Sketch Watch seeds sprout, including the roots. Take a paper towel and fold it to fit in a CD case or cassette tape case (or anything flat and clear). Put a seed in the middle of the towel and sit the whole thing in a shallow pan of water. The roots sprout first, and go down toward gravity (due to gravitropism response). If you want to add some fun, rotate the case every day and create "Etch A Sketch" art with the roots!

Longer, more involved preparation activities (30 min+)

****Hamburger Plant**, idea adapted from the JMG activity; using different colors of felt, cut out hamburgers and talk about where every ingredient comes from (all the way back to plants---so for the beef, it came from a steer that eats plants; mayonnaise came from vegetable oil as well as eggs, from chickens which eat grasshoppers which eat plants, etc.); I got felt squares from an arts and crafts store and cut them into fourths to make it easier to distribute to the kids and create less waste; for each camper: 2 pieces light brown felt (top and bottom buns, can use Sharpie to put sesame seeds on top bun), one piece dark brown felt (beef, can put 'sizzle' lines on with a Sharpie if desired), one piece light green felt (lettuce), one piece dark green felt (pickle slices), one ½ piece white felt (mayonnaise squiggles), one piece yellow (cheese slice and mustard squiggles), 2 pieces red (tomato slices and ketchup squiggles), and one pipe cleaner cut into thirds and made into tiny circles for onion slices (use a

white, yellow, or purple pipe cleaner); the kids loved this (put them in ziploc bags to keep all of the pieces together)

****Hairy Caterpillars** (JMG activity) – using pantyhose and grass seed, make a series of balls of potting soil/grass seed mix, each section separated by knots or tiny rubber bands; decorate with unbent bobby pin for antennae, googly eyes; water on Styrofoam plate either at home or on windowsill at camp and cut the ‘hair’ as it grows

****Build a Flowering Plant** – use straws, Q-tips, tissue paper, etc. to make a model flower that has pollen, sepals, petals, pistils, stamens, stem, leaves, even roots! Talk about what parts of the flower do what, how a fruit forms from the flower, etc. Activity kit has enough material for the first 30 students, and then you can buy additional supplies as needed from Walmart to keep doing the activity from then on. Kit costs \$23, available at www.sciencekit.com

****Make recycled paper** (MESSY) - tear tissue paper, newspapers, and collected plant materials into tiny pieces (postage stamp sized or smaller) in a dishpan (one per group of about 4 kids) and add water to make a slurry with the consistency of oatmeal, then pour a cup or two of the slurry through a screen; some kids poured into a cookie cutter resting on top of the screen in order to make shapes (keep shapes simple---hearts, diamonds); press all of the excess water out and leave to dry (still on screen) for a few days on top of a table---tissue paper makes colorful paper, plant specimens and seeds add texture and interest

Nature masks – campers trace mask designs (from Junior Master Gardener, but any mask pattern will work) onto posterboard and then cut them out with scissors. They decorate the front with various beans (black beans, red beans, navy beans, black-eyed peas, dried peas, etc.) in their own designs. Some add feathers for ‘ears’ on the masks (feathers from a craft store, in different colors). The next day (after they dry) we hot glue a short piece of bamboo (sticks or dowel rods would also work) to one side of the back of the mask so they can hold it up to their face to use it.

****Go Suck a BUG**, modified from a Junior Master Gardener activity—take clear filmstrip canisters [2” diameter, 1.5” high, 2 oz. capacity (ordered from Consolidated Plastics)] and use a drill press to punch two holes in the top of the lid (before camp) that are the same diameter as aquarium tubing (from Walmart---get the big rolls and cut them down to 1’ sections, each kid cuts his 1’ section down to 2 six-inch sections). Each camper gets one pre-drilled canister, one section of tubing (that they will cut in half), a piece of masking tape about 3” long, and a square of gauze (or piece of cheesecloth about 2” x 2”). Push the tubing into the holes in the lid so that about an inch of each is inside the container. On one of the tubing ends inside the container, wrap the gauze around it and tape it in place. This will prevent inhalation of bugs. To use the bug sucker, aim the open-ended tube over a bug and suck into the tube that has the gauze. You will vacuum the bug up and into the container, but not into your lungs (because of the gauze). Now you can watch your bug while it is inside your collection container. Kids love to practice bug sucking with dry rice (“practice maggots”), and then you can send them outside to vacuum pests off of the plants.

****Ties that Coil** (JMG activity) – Buy old ties from a local thrift store, cut the widest part off, and use rolled up newspaper to ‘stuff’ the length of the tie (trying to pack in actual stuffing is hard and tends to break the stitching on the back of the tie--you may want to reinforce the stitching on the backs of the ties by putting some hot glue over the seam the day before). Insert a thick floral wire, fold the ends of the tie over and hot glue them in place to keep the stuffing and wire in, then hot glue googly eyes onto one end. You now have a pose-able snake. You could have kids research certain types of snakes, cut the tie to the correct length for that type, and use fabric paint to make the snake look as life-like as possible if you want, but the kids have fun making their own species.

****Make your own soap** (MESSY). We use molds from the craft store, color the soap in the molds with food coloring, and add some essential oils for scent. Some kids fill their molds halfway with one color and then after it hardens, add a second layer which they make a different color. I also have plastic beads of soccer balls, flowers, animals, and other fun things which some kids choose to put into their molds before the soap hardens. This activity needs a lot of adult supervision (adults pour the melted glycerin). A 5-pound bag of glycerin chunks makes about 20 bars of soap. Kids that are waiting their turn for the melted glycerin stay busy by making their own bath salts (see below).

Make your own bath salts by mixing 1 part kosher salt with 1 part Epsom salt in dishpans. Some campers choose to add some ground (in a food chopper) oatmeal or powdered milk as well (use half as much as one of the salts). They add some essential oil and pack the mix into Mason jars with lids, which we label with the accompanying stickers (by name and scent). A 3-pound box of kosher salt yields about 6 cups; a 6-pound bag of Epsom salt yields about 11 cups.

****Make lip balm**, using a hot plate and small pan. Get plastic lip gloss containers from Consolidated Plastics that are about 1.5” in diameter and 0.5” high, ¼ ounce (\$32.25 for 100--we get white ones). We use a recipe from one of the many online that uses vegetable oil, beeswax (3/8 of a bar made enough for over 20 containers), essential oil, glycerin and vitamin E (get the glycerin and vitamin E capsules in the pharmacy section of Walmart--kids use scissors to cut open and squeeze out the vitamin E from the capsules). Again, this is an activity with a lot of adult participation, but the kids really enjoy making their own lip gloss, and the boys give it to their mothers or sisters.

****Dying cloth** – simmer some blueberries and water in a big pot on a stove with some alum added as a mordant (so the cloth retains color better); campers use rubber bands and folding/knotting to make a ‘tie-dye’ pattern on their handkerchief, then place the handkerchiefs in the simmering blueberries for a few minutes (adult mans the pot); spaghetti tongs are used to remove the handkerchiefs after a few minutes, cool water is used to rinse the solids off, rubber bands are cut and knots undone so that the cloth can dry. Other plants to try – beets, cabbage, spinach, strawberries, pokeberries, onion skins.

Morpho Puppets – JMG activity using socks to make a hand puppet that turns from a caterpillar to a cocoon to a butterfly (outside of sock is decorated like a caterpillar using fabric markers and buttons for eyes (if the campers are old enough to sew a button on), inside of sock is decorated like a butterfly with cloth wings, button eyes, and a proboscis out of felt if the kids can sew, or just fabric markers if they can’t). Put the sock puppet on with the whole sock just on your hand, all smooshed up. As the

caterpillar 'eats', it grows (stretch the sock out to its full length along your arm), then makes a cocoon, which is represented by stopping halfway through turning the sock inside out while pulling it off of your arm (no caterpillar or butterfly shows, just the plain sock, which looks like a cocoon). After it finishes pupating, it becomes a butterfly (finish pulling the sock off of your arm inside out, showing the butterfly!).

****Track Casting** – flatten wet sand inside a bowl (tracks available from Nature Watch), press track into wet sand, pour plaster of Paris into track– leave to harden for a couple of days

****Food Chain Game** – spread popped popcorn over a large area outside; distribute felt squares ('name tags') and safety pins to kids (brown felt = hawks, green felt = frogs, yellow felt = grasshoppers); give each player a sandwich baggie marked halfway up with a strip of masking tape; when the simulation starts, grasshoppers try to fill their bags to the halfway line with popcorn while watching out for frogs – if a frog tags them, the grasshopper must empty its 'stomach contents' (popcorn) into frog's baggie and go sit down on the sidelines to represent being eaten; frogs try to get halfway-full baggies while watching out for the hawks who will eat them (and make them empty their stomachs). . . the day ends after a set amount of time (a couple of minutes or so) or when one species is gone. . . hawks can only eat frogs which can only eat grasshoppers which can only eat popcorn. . .if an animal is not eaten during the simulation, yet does not have a full stomach, they still die due to starvation. . . after simulation talk about why species usually do not eat just ONE thing in nature (and why those that do are at higher risk for extinction---pandas, koalas, etc.), and why there are more prey than predators (energy consumed is used by the prey to live and reproduce, so those further up the food chain only get a portion of the total energy consumed by their prey and therefore need to eat many grasshoppers, etc. to get the energy they need to live); students often want to try playing a different role in subsequent simulations, or vary the number of each type of animal to see what happens---it works best with about a 7:3:1 ratio of hoppers: frogs: hawks, but students can figure that out for themselves

****Create a Bug** –give campers random objects (parts of egg cartons, colored cellophane, buttons, pipe cleaners, artificial flower petals, netting, metallic confetti, beads, toothpicks, pom poms, etc.) and allow them to create a bug; after finishing, they can do a 'show and tell' with their bug and talk about where it lives, what it eats, etc.

Bamboo Windchimes – Assemble windchimes from various lengths of pre-drilled bamboo, decorating with beads, paint, seeds, etc. Use fishing line to hang the bamboo pieces. (Kids like this, but some kids have zero frustration tolerance and do not have the patience to thread slippery fishing line through holes and then tie the line.)

Sundials – Cut gnomens out of posterboard or cardboard (gnomen should be the same degree as your latitude—in Stillwater it is 36 degrees) then fasten to the middle of a square or rectangular piece of cardboard or posterboard to make blank sundials—put outside in a sunny location and mark the position of the shadow each hour (don't move the sundial during this process).

Botanical Wood Prints – using potatoes and cheap metal knives and spoons, carve half of a potato into a positive or negative impression (simple is best—stars, hearts, etc.) and then let students use the potato 'stamps' to make block prints using tempera paint and paper

Gardening Obstacle Course – jump rope with a piece of an old watering hose, carry radishes in a plastic spoon while running around cones, use a trowel to roll a potato 20 yards, carry water to a bucket using only a sponge, crawl through a ‘worm’ tunnel, rake a lettuce head through cones, potato shotput, etc.

****Nutty Investigations (NOISY)** – drop soup cans with pennies inside through a 2’ long (4” diameter) PVC pipe to try and break nuts and/or seeds (in their shells) open; keep track of how many pennies it takes to break open walnuts, peanuts, pistachios (should be zero), acorns, cacao, pecans, etc. (peach pits take a lot of pennies!!!); make sure the students repeat several times with each type of nut or seed, and compare across groups; reiterate the importance of keeping the trials ‘fair’ by using the same length of PVC pipe, counting all of the pennies, not slamming the soup cans down the tube, etc.; have the students make a chart of the results (with averages over multiple trials, depending upon the age of the kids)

Alien Classification – students cut out ‘critter cards’ (total = 24) on http://www.microbeworld.org/index.php?option=com_content&view=article&id=344&Itemid=212 and make their own dichotomous key to learn how scientists classify living organisms; I like this particular classification ‘critter’ because there are no preconceived notions about how they ‘should’ be classified; I like to have students do this activity in pairs (more than two get into too many disagreements about how it should be done) (Another version of classification is in the Junior Master Gardener Basic Curriculum and is called “Linnaeus’ World Wide Names” p. 142-143)

****Make a salad box** (modified from <http://extension.umd.edu/growit/food-gardening-101/step-1-build-salad-box%E2%84%A2>)

Supplies needed per box: 1” x 4” x 4’ long pine board, (8) 1 5/8” gold screws, 40” of 5/16” rope, 1’ x 1’ of ¼” hardware cloth, 4’ of duct tape, staples (for wood), sandpaper, newspaper, potting media, seeds or seedlings, paint

Tools needed: staple gun, saw, tinsnips, scissors, drill, screwdriver

Directions: Use tin snips to cut a 1’ x 1’ section of hardware cloth. Fold duct tape around all edges of hardware cloth to prevent pokes/snags. Cut pine board into (4) 1’ pieces. Drill 5/16” holes at the 4” and 8” points in the center of two of the boards. These holes will be where the rope goes through for the handles. Drill two pilot holes in one end of each board for the screws that will hold all the boards together. Use the gold screws to screw the box together, making sure that the two pieces with holes for the handles are opposite each other. Cut the rope into two 20” lengths, and thread each piece through the holes in one of the boards, knotting the rope on the inside of the box (now you have handles). Use the sandpaper to remove any splinters. Staple the hardware cloth to the bottom of the box (this allows drainage). Paint the box if desired. Put newspaper inside the box to prevent any potting media from falling through, then fill with potting media and plant lettuce, flowers, or anything else you desire in your mobile salad box! (Note: A 64 quart bag of potting media fills 18 of these boxes about halfway full.)

Cost:

		<u>Per Box</u>
1# box of gold screws (makes 22-25 boxes)	\$5.94	0.27
1” x 4” x 8’ pine board	\$4.38/each	2.19
50’ of rope	\$5.18	0.35

36" hardware cloth x 10'	\$17.97	0.60
20 yd. duct tape	\$3.37	<u>0.22</u>
		\$3.63

**** Nature Weaving** - Have kids gather sticks ~ 18-24" long (four sticks each—to make a 'frame'). Tie about 20 pieces of yarn (earth tones look best) so that they make a vertical connection between the top and bottom sticks. About 2' pieces of yarn work well. Weave collected plant materials (grasses with seedheads, flowers with stems, etc.) between the yarn pieces to make a 'nature' wall hanging.

**** Stepping Stones** - Collect small plastic containers (sandwich-size works well) to serve as molds for the stones. Spray cooking oil inside the containers to make removal of the stone easier. Mix Quikrete and water, then pour into the molds. I mix a batch for each camper. I use a plastic cup, commonly given away by restaurants, to measure the cement (in my cups, I fill to the equivalent of a 16 oz drink). I dump that into a bucket (disposable—like the kind livestock supplements come in) and add about 3 to 4 oz of water (just enough to make the cement mix wet—no standing water---go for the consistency of oatmeal). Then I use a stick or paint stirrer stick to mix the Quikrete and water. After the mix is poured into a mold, tap the mold or use your hand to level and compress the mix. Campers can push decorative stones, glass beads, etc. into the mix while it's wet (no hurry---you probably have 20-30 minutes to work with). To write words, use stone stamps from a craft store, or use popsicle sticks. If water starts working its way to the top of the cement mix, just use a paper towel to dab it off. By the next day the stones should be hard enough to remove from the molds. A 10# bag of Quikrete makes about 5 stones in the size I make.

****Rainbow Chips** (from LifeLab "back pocket" activities) - Collect paint chips from home improvement stores, Walmart, etc. Give each camper (or pair of campers) one or two color chips, and have them walk around the garden and look for plants or objects that have colors that match the color of their chips.

****Flower Petal Bookmarks** (from LifeLab's "back pocket" activities) Give each camper about 6" of painter's tape to take with them into the garden. Allow them to collect petals or leaves of whatever colors appeal to them. By taking the tape into the garden, kids will not over-collect. When the tape is full, they are done collecting. Make sure to just have one layer of petals on the tape, not whole flower heads or succulent leaves. Stick the painter's tape onto 2" wide strips of watercolor paper (about 8" long) so that the petals are sandwiched between the tape and paper. Use a rubber mallet to hammer the tape---make sure to get every part of the tape hammered well. When you are done, peel the tape off and look at the colorful art! Punch a hole at one end of the paper and thread yarn through. Now you have a bookmark!

Healthy Snacks

Taste six different types of apples (many kids have only had red or golden delicious apples, so they will enjoy tasting Granny Smith, Braeburn, Gala, and Fuji apples as well).

Robust Rainbow snack (JMG activity)—watermelon, cantaloupe, green grapes, cherries, blueberries, pineapple all mixed into vanilla yogurt

****Symmetry Snacks**—(JMG activity) using graham crackers, yogurt (or peanut butter or icing), raisins, M&Ms, pretzels, marshmallows, shredded carrots, cherry tomatoes, grapes, and other small snack foods, each camper makes an insect model snack. Talk about how insect bodies are symmetrical, so each camper makes an insect that looks symmetrical. Have the kids ‘show and tell’ their creations before eating them. The kids all love this, and there are a lot of different designs---some kids have graham cracker bodies with food on top, some sandwich their snack foods in between two graham crackers, etc.

****Strip Chips** (JMG activity) – kids use a vegetable peeler to peel strips of sweet potatoes onto a paper plate, then take turns microwaving the strips for about half a minute (salt to taste)

Magical Fruit Salad (from JMG’s “Health and Nutrition from the Garden”) – make this (basically fruit salad in vanilla pudding) while discussing the health benefits of different colors of fruits; try to include all of the colors of the rainbow in the salad (blueberries, strawberries, grapes, etc.). It’s ‘magical’ because you put the pudding mix in with the fruit, but don’t tell the kids what it is. Then after you add all the fruit, you pour the milk in for the pudding and as you stir it makes ‘magic’ (pudding, LOL).

****Kiwi Rice Cake Teddy Bear Snacks** – make a bear face out of a rice cake, nut or fruit butter, kiwi slices, red and green grapes – from Lana’s Fruit and Vegetable Snack Recipes Cookbook (16 simple recipes), available for 19.95 on <http://www.learningzonexpress.com/>;

Tortillas in a Bag – recipe from Oklahoma Ag in the Classroom at <http://www.clover.okstate.edu/fourh/aitc/lessons/intermed/tortilla.pdf>

A Field of Beans from Oklahoma Ag in the Classroom at

<http://www.clover.okstate.edu/fourh/aitc/lessons/legumes.pdf>; give every pair of students a clear plastic cup and some mung bean and/or alfalfa seeds (from health food store), and have the students draw what the seeds look like on the first square of a piece of paper that has been folded into six sections. Then have them put the seeds in the cup and rinse them with water, and have them draw their cup with seeds in the second section of the paper. Each morning, have the students draw what they see and then rinse the seeds with fresh water each day. After a few days, let the students eat the sprouts (bring crackers and ranch dressing). To help with rinsing and draining, you can rubber band a piece of cheesecloth over the top of the cup.

Veggie Bagel Face – from Lana’s Fruit and Vegetable Snack Recipes Cookbook; make a funny face on half of a bagel using cream cheese, snap peas, shredded carrots, cherry tomatoes cut in half

Stoplight Bites – from Lana’s Fruit and Vegetable Snack Recipes Cookbook; use half of a strawberry, a piece of pineapple, and a slice of kiwi to assemble a ‘stoplight’ on a piece of graham cracker with yogurt

****Strawberry Mini-Mouse Nibbles**—from Lana’s Fruit and Vegetable Snack Recipes Cookbook; using a strawberry, slices of almond, and string cheese, make a mouse on top of a graham cracker topped with yogurt

Solar Oven S’mores– make solar ovens following directions at <http://smile.cosi.org/solar-powered-cooking.pdf> and use them to melt s’mores or fill a banana with chocolate and let it melt to make a banana split (add ice cream); it takes a while to cook with a solar oven sometimes—you can make ice cream in a bag while you are waiting! Lesson at <http://www.clover.okstate.edu/fourh/aitc/lessons/extras/recipes/icecream.html>. Make sure you use quality plastic bags and that the kids are gentle with them so you don’t end up with salt in your ice cream or ice cream on the floor!

Gardening Camp Ideas – Harry Potter Theme

Make wands out of bamboo, cardboard tubes off clothes hangers, stiff aquarium tubing, chopsticks, etc. and fill /decorate with colorful feathers (=phoenix feathers), twisted tinfoil (=hair from unicorn tail), sequins or glitter (=dragon scales), wiggle worms (=metallic pipe cleaners), etc.

Sort campers into houses (Gryffindor, Slytherin, Hufflepuff, Ravenclaw). House colors – Gryffindor is red/gold; Ravenclaw is blue/bronze; Hufflepuff is yellow/black; Slytherin is green/silver.

Put plastic gemstones in each house’s Mason jar as rewards for cleaning up, being orderly, etc. The house with the most gems by the end of the day/week/camp gets a special surprise.

Snacks:

Droobles Best Blowing Gum--- bubble gum
Bertie Bott's Every Flavor Beans--- jelly beans
Dumbledore's Lemon Drops --- lemon drops
Owl Pellets--- Chocolate covered peanuts
Ten Ton Tongue Taffy ---Salt Water Taffy
Whizzing Worms -- gummy worms
Witches Teeth-- Candy Corn
Rattlesnake ---- beef jerky
Dried Fruit Flies ---- golden raisins
Lizard Eggs ----- blueberries
Warthog Ears ---- blue nacho chips
Fried Grasshoppers ---- fried onion toppers

CLASSES –

Ancient Runes

Make “quill” pens using big feathers; write your name in runes (see below):

A=	Ɔ	H=	Ɔ	O=	⌘	V=	Ɔ
B=	Ɔ	F=		P=	Ɔ	W=	Ɔ
C=	<	J=	Ɔ	Q=	<	X=	⌘
D=	⌘	K=	<	R=	Ɔ	Y=	Ɔ
E=	Ɔ	L=	Ɔ	S=	Ɔ	Z=	Ɔ
F=	Ɔ	M=	⌘	T=	↑	TH=	Ɔ
G=	X	N=	Ɔ	U=	Ɔ	NG=	⌘

Arithmancy

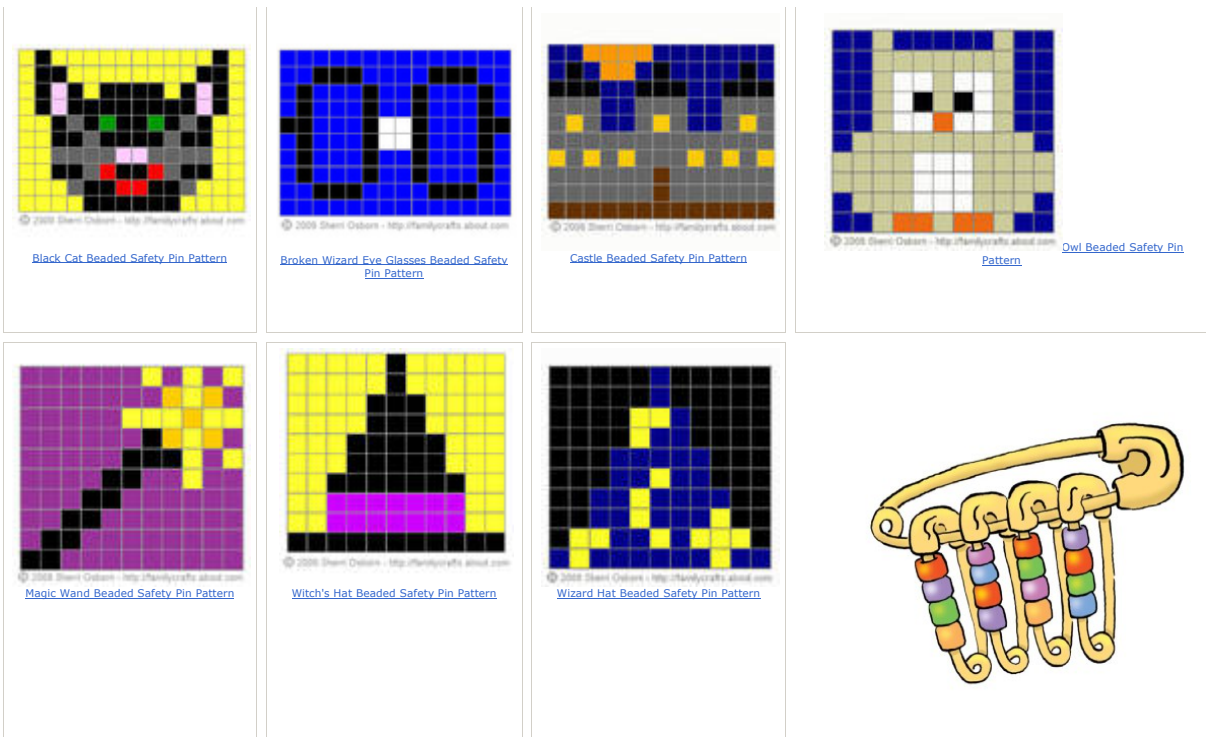
Make Harry Potter coins (galleons, etc.) with fimo clay (leave a hole to make a necklace)

Care of Magical Creatures

Catnip-filled stuffed mice cat toys

Homemade dog treats – recipes online

Owl or cat beaded safety-pin jewelry with seed beads and safety pins:



Charms / Spells

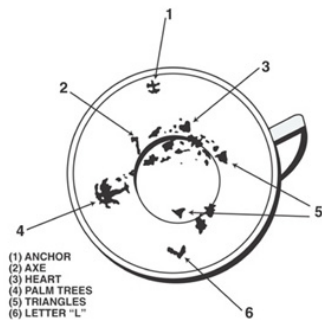
Create your own spells, write them down in a book you make out of paper with construction paper cover and held together with a stick and rubber bands or tied together with yarn, etc.

Defense Against the Dark Arts

Muggle version of quidditch – rules online (they have college quidditch teams!)

Divination

Read tea leaves (or read mint leaves floating in iced tea?) or some variation—let the kids say what they see and what they think it means:



Make crystal balls (baby food jars with mushroom shaped wad of polymer clay attached to underside of lid, covered in glitter; fill with water with a few drops of glycerin and some more glitter). Some fortunes. . . .

1. A Basilisk (snake like monster) will escape and hide in your plumbing. Beware long baths.
2. Congratulations! You will be drafted as the next Seeker for the Gryffindor Quidditch team.
3. Oh no! Due to a Transfiguration error, you will spend several weeks as a pumpkin.
4. Way to go! During Astronomy class, you will discover a new planet which will be named for you.
5. Watch out! You will be stampeded by a herd of raging Hippogriffs.
6. You will fall in love with a Centaur and move to a tree house in the Forbidden Forest
7. The Weasley brothers will hire you to test their new joke shop products. You will never be the same!
8. You will live a very long life, but as a werewolf. Beware of full moons!

Herbology

Decorate clay pots with glitter, stickers, paint, gems, etc.

Propagate snake plants and spider plants.

Sprout seeds in test tubes half-filled with different colors of crystal gel (food coloring) in layers.

Dig up ginger root 'mandrakes' with faces drawn on them, while wearing earmuffs (mandrakes scream).

Harvest Bubotuber pus (break open an *Aloe vera* plant).

Hydrate a resurrection plant.

Propagate a plant that needs rooting hormone and give the powder a magical name.

Potions

Make butterbeer – many recipes online (or stir caramel ice cream topping into ginger ale or cream soda).

Transfiguration

-Make and read messages with invisible ink (**ink** is ¼ c. water, 1 t. cornstarch, cooked 3 minutes and applied with a toothpick; **revealing solution** is ¼ c. water with 10 drops iodine)

-Make shrinky dink keychains/zipper pulls.

-Weave bookmarks in house colors using straws.

Gardening Camp Ideas – Passport Theme - do activities involving foods and customs and/or famous people from a variety of countries; make a 'passport' that kids can get stamped or stickered each day

****Italy** Be Michelangelo** -- Tape pictures (of the Mona Lisa or similar) under tables and let kids color them while laying on their backs like Michelangelo.

Make cat toys -- Catnip's Latin name is *Nepeta cataria*, "Nepeta" being derived from the Etrurian city of Neptic where the plant was mainly grown. Get a box of catnip from a supermarket or pet store and divide it among the campers. Give each camper two socks (the smaller the better) and some stuffing (from the fabrics department). The campers stuff one sock with stuffing and some catnip (a teaspoon works well), then tie the sock closed and stuff it all into a second sock, which can be tied or knotted closed and donated to a cat shelter.

Create a Leaning Tower of Pasta – using dry spaghetti and mini-marshmallows, see which team of campers can build the tallest, craziest, or strongest structure (use ping pong balls, golf balls, baseballs, softballs, soccer balls, and maybe a bowling ball to test for weight support).

****England**** ---- this is where terrariums originated as "Wardian cases", as a Dr. Ward, who loved his ferns, had to come up with something to protect them from the polluted English air

Make mini-terrariums – take Mason jars and have the campers collect moss, lichens, small stones and twigs, etc. and design a miniature terrarium

****Greece** Leaf crowns** – collect fake leaves, or pull apart strands of fake ivy. Use floral tape to attach each leaf to a floral wire fitted to each camper's head (gold leaves are really fun) and voila! Leaf crown!

Grapes – (originally from the country of Georgia, Phoenicians took grapevines to Greece around 1000 BC); Recline on pillows on the floor and eat bunches of grapes for a snack!

Mosaics – use 15-bean soup mix, confetti, or other multi-colored objects to create mosaics on scrap pieces of cardboard.

****Indonesia**** --- cloves originated in Indonesia, oranges probably originated in Asia

Pomanders – push dried cloves into an orange in a pattern. You can roll the orange (which will be sticky after inserting cloves) in a mix of spices such as cinnamon, allspice, and nutmeg and tie a ribbon around it if you wish—after air drying, the pomander should last several years and keep a drawer or closet smelling fresh

****Mexico** Cacao** – discuss the history and harvest of cacao, and how it's made into chocolate. Go get some cacao seeds from a health food store and let the campers each try one (they are BITTER!!).

Rainsticks – (the Aztecs made rainsticks by drying cactus, pulling the spines, and hammering the spines back into the cactus, then filling with small stones); push pins or nails or toothpicks through a cardboard tube and put a handful of beans or rice inside before taping the ends closed, then decorate your rainstick (I got a carpet roll tube and we made the world's largest rainstick at camp!!!).

****Egypt**** Papyrus – if you have a papyrus plant, you can pound out your own paper (or at least show the campers what papyrus plants look like); make your own ‘papyrus’ by crumpling and uncrumpling a brown paper sack, cut open to lay flat. Let campers use hieroglyphics (many online alphabets) to write their names and make bookmarks, or punch a hole and let them make little hieroglyphic papyrus necklace pendants

Killing Time before parents arrive, after cleanup, etc.

Food J-I-N-G-O (available on amazon.com for \$15)

Coloring pages of insects, fruit, or trees copied from Enviroscapes: Color Your Imagination Wild! (2000, MindWare, ISBN 1-892069-21-0)

Just for Fun Games

☺ Mosquito Tag – The staff tags students with shortened pool noodles. When tagged, kids must freeze. Someone can unfreeze them by shouting the name of a bug spray (D-Con, Off, etc.) and tagging them again.

☺ Octopus Relay – Each team sends eight players at a time who hold on to a hula-hoop with one hand. Eight buckets are scattered around the area with three tennis balls in each (one per team). Each group must go to each bucket and have one person pick up a ball (one person per bucket) until all eight have a ball. Team must circle around a cone and then return the balls to the buckets in the same manner.

☺ Missile Attack – Give each player a straw and 5 cotton swabs. They try to shoot missiles (cotton swabs) to a bucket by blowing into the straw.

☺ Scream Race – Take a deep breath and exhale, saying a loud “aaahhh” as you run. Run as far as you can. Stop when you stop for breath.

☺ Flour Tag – Put a cup of flour in an old sock and tie a knot to keep the flour contained. Players use the sock to tag other players, leaving flour marks on their shirts (dark shirts show flour the best). The one with the fewest flour marks wins.

Games to help the kids cool off on a hot day

Leaking Relay – Drill holes in coffee cans or small buckets. Players fill with water and carry above their heads to an empty bucket. They dump remaining contents and run back to start.

Cold Potato – The group stands in a circle and tosses a water balloon across the circle. Out if drop balloon.

Soap Shrink – Divide into 2 or 3 player teams. Give each a bar of soap (hotel samples work well) and a bucket of water. Teams wash hands to shrink the soap. If the bar breaks, they are disqualified. Call time after five minutes. Smallest bar wins.

Obstacle Course – Set up an up, over, around and through obstacle course that players must complete carrying a cup of water. Dump cup contents in bucket at end of course.

Ice Cube Melt – Melt in hands. Fastest to melt ice cube wins.

Feet Freeze – Using a bucket or pool with ice cubes, players retrieve marbles with their toes and drop in buckets.

Wrapping Up:

****Know and Show Sombrero** (JMG activity) – use newspaper, packing tape, and various craft items to make hats for each child; decorated by the child to show what they learned over the week, what they liked the most, etc. After the sombreros are made, let the campers ‘show and tell’

****Decorate a puzzle piece** –Each camper decorates a puzzle piece with a scene representing their favorite aspect of camp (puzzle pieces ordered from www.compozapuzzle.com; we used the blank community puzzle, which comes with 48 pieces of various sizes and costs \$10.99). Now the camp has an interesting piece of art made from happy memories!

Resources:

Aardvark paper straws: <http://www.aardvarkstraws.com/> (Giant, 10.5" (Unwrapped) straws for extra tall shakes and smoothies, 10.5" long with a diameter of .292". Box: \$27.00 (350 qty.)).

Consolidated Plastics <http://www.consolidatedplastics.com/Poly-Cons-With-Attached-Lid-C257.aspx> (for suck-a-bug containers--get the clear ones 2" diameter, 1.5" high--\$58.17 per 100; for lip gloss get the white ones, 1.5" diameter, 0.5" high, \$32.25 per 100)

Educational Innovations <http://www.teachersource.com/> (UV beads)

Junior Master Gardener program <http://www.jmgkids.us>

Junior Plant Scientist program (free, but must create an account) <http://jrplantscientist.ath.cx>

<http://www.compozapuzzle.com> (blank jigsaw puzzles)

Maggots: http://knutsonlivebait.com/extrabright_maggots.html (\$8 plus s/h for 500 maggots) or try your local bait store---fisherman use these, especially for ice fishing---maggots come in a rainbow of colors! Also <http://www.vadosbait.com/index.php/bait-store/maggots/maggots-1000-411.html> (\$9 plus s/h for 1000 maggots)

Nature Watch <http://www.nature-watch.com/> (leaf and flower rubbing plates)

Oriental Trading Company www.orientaltrading.com (color your own flower pots)

Science Kit www.sciencekit.com (build a flowering plant model kit)

References:

Cornell, Joseph. Sharing Nature with Children. 1978 (updated 1998). DAWN Publications.
ISBN 1-8832220-73-4

Junior Master Gardener curricula, available through Texas A&M (link from www.jmgkids.us):

Learn, Grow, Eat & Go!, \$52

Level One Teacher/Leader Guide, \$56

Level One Student Handbook, \$15

Literature in the Garden, \$40

Wildlife Gardener, \$40

Health and Nutrition from the Garden, \$10 while supplies last (going out of print)

Level Two Operation WATER – Dr. Thistle Goes Underground (Soils and Water), \$40

Level Two Operation Thistle – Seeds of Despair (Plant growth and development), \$40

Lovejoy, Sharon. Toad Cottages and Shooting Stars. 2009. Workman Publishing, New York.

ISBN 978-0-7611-5043-5 \$14.95; Roots, Shoots, Buckets and Boots. 1999. Workman Publishing,

New York. ISBN-13: 978-0-7611-1056-9 \$13.95 ; Sunflower Houses: A Book for Children and

Their Grown-Ups. 1991. Workman Publishing, New York. ISBN 978-0-7611-2386-6 \$13.95